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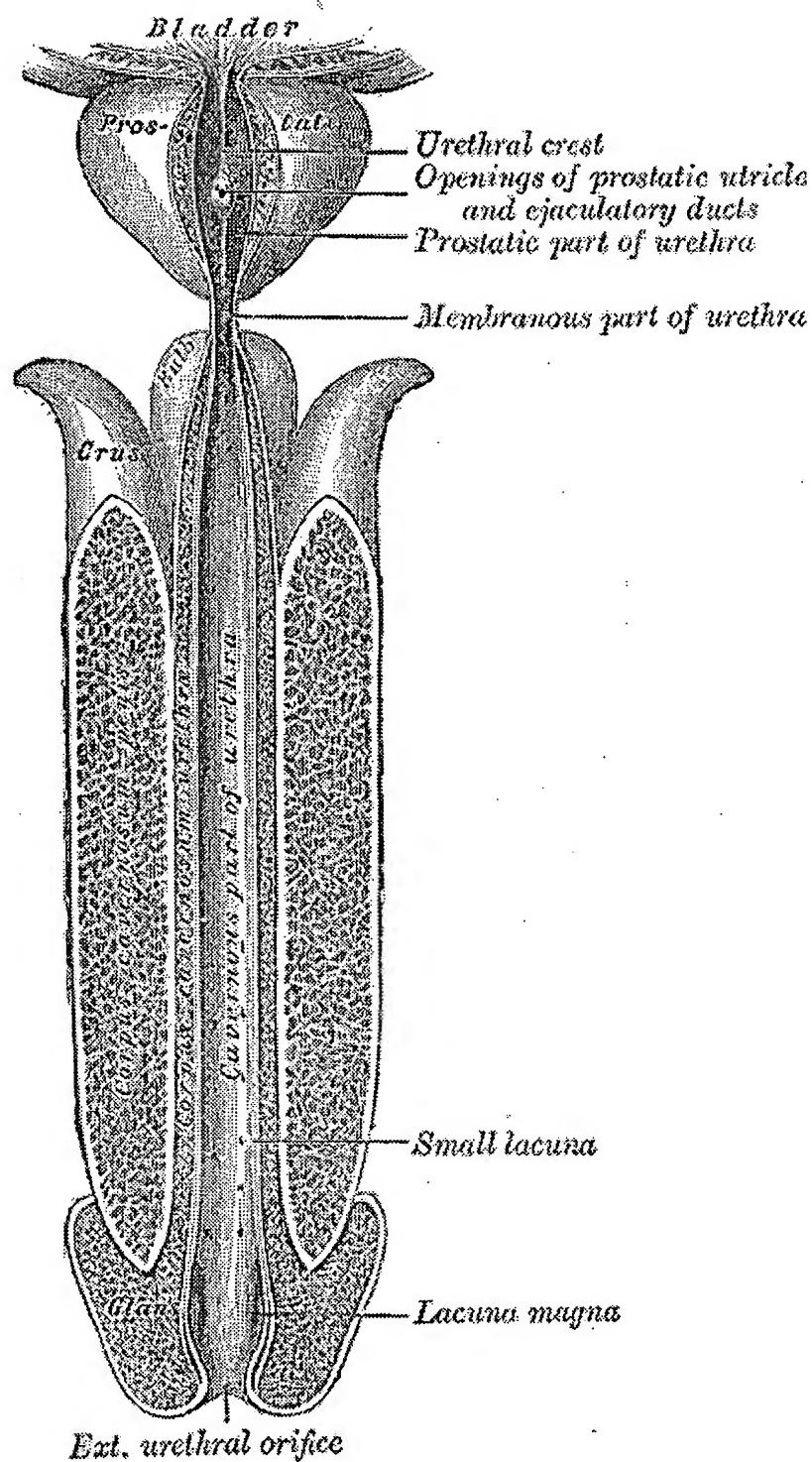
Henry Gray (1821–1865). Anatomy of the Human Body. 1918.

### 3b. 4. The Male Urethra

#### (Urethra Virilis)

The **male urethra** (Fig. 1142) extends from the internal urethral orifice in the urinary bladder to the external urethral orifice at the end of the penis. It presents a double curve in the ordinary relaxed state of the penis (Fig. 1137). Its length varies from 17.5 to 20 cm.; and it is divided into three portions, the **prostatic**, **membranous**, and **cavernous**, the structure and relations of which are essentially different. Except during the passage of the urine or semen, the greater part of the urethral canal is a mere transverse cleft or slit, with its upper and under surfaces in contact; at the external orifice the slit is vertical, in the membranous portion irregular or stellate, and in the prostatic portion somewhat arched.

The **prostatic portion** (*pars prostatica*), the widest and most dilatable part of the canal, is about 3 cm. long. It runs almost vertically through the prostate from its base to its apex, lying nearer its anterior than its posterior surface; the form of the canal is spindle-shaped, being wider in the middle than at either extremity, and narrowest below, where it joins the membranous portion. A transverse section of the canal as it lies in the prostate is horse-shoe-shaped, with the convexity directed forward.



The male urethra laid open on its anterior (upper) surface.

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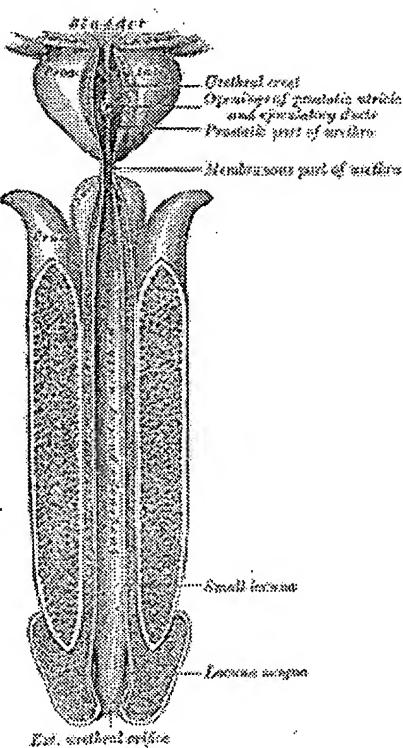


FIG. 1142—The male urethra laid open on its anterior (upper) surface. (See enlarged image)

Upon the posterior wall or floor is a narrow longitudinal ridge, the **urethral crest** (*verumontanum*), formed by an elevation of the mucous membrane and its subjacent tissue. It is from 15 to 17 mm. in length, and about 3 mm. in height, and contains, according to Kobelt, muscular and erectile tissue. When distended, it may serve to prevent the passage of the semen backward into the bladder. On either side of the crest is a slightly depressed fossa, the **prostatic sinus**, the floor of which is perforated by numerous apertures, the **orifices of the prostatic ducts** from the lateral lobes of the prostate; the ducts of the middle lobe open behind the crest. At the forepart of the urethral crest, below its summit, is a median elevation, the **colliculus seminalis**, upon or within the margins of which are the orifices of the prostatic utricle and the slit-like openings of the ejaculatory ducts. The **prostatic utricle** (*sinus pocularis*) forms a cul-de-sac about 6 mm. long, which runs upward and backward in the substance of the prostate behind the middle lobe. Its walls are composed of fibrous tissue, muscular fibers, and mucous membrane, and numerous small glands open on its inner surface. It was called by Weber the **uterus masculinus**, from its being developed from the united lower ends of the atrophied Müllerian ducts, and therefore homologous with the uterus and vagina in the female.

The **membranous portion** (*pars membranacea*) is the shortest, least dilatable, and, with the exception of the external orifice, the narrowest part of the canal. It extends downward and forward, with a slight anterior concavity, between the apex of the prostate and the bulb of the urethra, perforating the urogenital diaphragm about 2.5 cm. below and behind the pubic symphysis. The hinder part of the urethral bulb lies in apposition with the inferior fascia of the urogenital diaphragm, but its upper portion diverges somewhat from this fascia: the anterior wall of the membranous urethra is thus prolonged for a short distance in front of the urogenital diaphragm; it measures about 2 cm. in length, while the posterior wall which is between the two fasciae of the diaphragm is only 1.25 cm. long.

The membranous portion of the urethra is completely surrounded by the fibers of the Sphincter urethræ membranaceæ. In front of it the deep dorsal vein of the penis enters the pelvis between the transverse ligament of the pelvis and the arcuate pubic ligament; on either side near its termination are the bulbourethral glands.

The **cavernous portion** (*pars cavernosa; penile or spongy portion*) is the longest part of the urethra, and is contained in the corpus cavernosum urethrae. It is about 15 cm. long, and extends from the termination of the membranous portion to the external urethral orifice. Commencing below the inferior fascia of the urogenital diaphragm it passes forward and upward to the front of the symphysis pubis; and then, in the flaccid condition of the penis, it bends downward and forward. It is narrow, and of uniform size in the body of the penis, measuring about 6 mm. in diameter; it is dilated behind, within the bulb, and again anteriorly within the glans penis, where it forms the **fossa navicularis urethræ**.  
$$6 \text{ mm} = 0.236 \text{ in.}$$

The **external urethral orifice** (*orificium urethræ externum; meatus urinarius*) is the most contracted part of the urethra; it is a vertical slit, about 6 mm. long, bounded on either side by two small labia.

The lining membrane of the urethra, especially on the floor of the cavernous portion, presents the orifices of numerous mucous glands and follicles situated in the submucous tissue, and named the **urethral glands** (*Littré*). Besides these there are a number of small pit-like recesses, or **lacunæ**, of varying sizes. Their orifices are directed forward, so that they may easily intercept the point of a catheter in its passage along the canal. One of these lacunæ, larger than the rest, is situated on the upper surface of the fossa navicularis; it is called the **lacuna magna**. The bulbo-urethral glands open into the cavernous portion about 2.5 cm. in front of the inferior fascia of the urogenital diaphragm.

**Structure.**—The urethra is composed of mucous membrane, supported by a submucous tissue which connects it with the various structures through which it passes.

The **mucous coat** forms part of the genito-urinary mucous membrane. It is continuous with the mucous membrane of the bladder, ureters, and kidneys; externally, with the integument covering the glans penis; and is prolonged into the ducts of the glands which open into the urethra, viz., the bulbo-urethral glands and the prostate; and into the ductus deferentes and vesiculæ seminales, through the ejaculatory ducts. In the cavernous and membranous portions the mucous membrane is arranged in longitudinal folds when the tube is empty. Small papillæ are found upon it, near the external urethral orifice; its epithelial lining is of the columnar variety except near the external orifice, where it is squamous and stratified.

The **submucous tissue** consists of a vascular erectile layer; outside this is a layer of unstriped muscular fibers, arranged, in a circular direction, which separates the mucous membrane and submucous tissue from the tissue of the corpus cavernosum urethræ.

**Congenital defects** of the urethra occur occasionally. The one most frequently met with is where there is a cleft on the floor of the urethra owing to an arrest of union in the middle line. This is known as *hypospadias*, and the cleft may vary in extent. The simplest and by far the most common form is where the deficiency is confined to the glans penis. The urethra ends at the point where the extremity of the prepuce joins the body of the penis, in a small valve-like opening. The prepuce is also cleft on its under surface and forms a sort of hood over the glans. There is a depression on the glans in the position of the normal meatus. This condition produces no disability and requires no treatment. In more severe cases the cavernous portion of the urethra is cleft throughout its entire length, and the opening of the urethra is at the point of junction of the penis and scrotum. The under surface of the penis in the middle line presents a furrow lined by a moist

mucous membrane, on either side of which is often more or less dense fibrous tissue stretching from the glans to the opening of the urethra, which prevents complete erection taking place. Great discomfort is induced during micturition, and sexual connection is impossible. The condition may be remedied by a series of plastic operations. The worst form of this condition is where the urethra is deficient as far back as the perineum, and the scrotum is cleft. The penis is small and bound down between the two halves of the scrotum, so as to resemble an hypertrophied clitoris. The testes are often retained. The condition of parts, therefore, very much resembles the external organs of generation of the female, and many children the victims of this malformation have been brought up as girls. The halves of the scrotum, deficient of testes, resemble the labia, the cleft between them looks like the orifice of the vagina, and the diminutive penis is taken for an enlarged clitoris. There is no remedy for this condition.

A much more uncommon form of malformation is where there is an apparent deficiency of the upper wall of the urethra; this is named *epispadias*. The deficiency may vary in extent; when it is complete the condition is associated with extroversion of the bladder. In less extensive cases, where there is no extroversion, there is an infundibuliform opening into the bladder. The penis is usually dwarfed and turned upward, so that the glans lies over the opening. Congenital stricture is also occasionally met with, and in such cases multiple strictures may be present throughout the whole length of the cavernous portion.<sup>13</sup>

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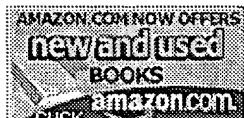
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